IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Kazumasa MASUDA, Atsushi HATCHO
Appl. No.	: 10/657,440
Filed	: September 8, 2003
For	: LIQUID INJECTOR FOR INJECTING CONTRAST MEDIUM AT VARIABLE RATE INTO A SUBJECT WHO IS TO BE IMAGED BY IMAGING DIAGNOSTIC APPARATUS
Examiner	: HALL, DEANNA K.
Art Unit	: 3767
Confirmation No.: 1430	

DECLARATION UNDER 37 C.F.R § 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. I, Kazumasa MASUDA, am a co-inventor on the above-identified patent application and familiar with the specification and prosecution history. I was born on April 5, 1966. I had been employed by Nemoto Kyorindo Co., Ltd. since April 1, 1993, and working in the injector field for over 15 years.

2. The following experiment was carried out in order to clarify the advantages of the present invention. In this experiment, I improved the injector so that it can inject contrast medium according to following variable patterns, and the group of Dr. Atsushi HATCHO (Nagano Red Cross Hospital) measured the CT value by using the injector and other following apparatuses.

METHOD

1. A CT scanner (900S, Toshiba Corporation), an injector (A-250 prototype, Nemoto

Kyorindo Co., Ltd.), and a custom-made phantom were used. Several injection patterns were tested, and CT value was measured to obtain a time-density curve (TDC).

2. Fig.1A shows a comparative pattern A where the injection rate is constant (2.0ml/sec, 30sec). Fig.1B shows a variable pattern B comprised of a linear decrease of injection rate from the start of injection to a set point of time (3.0ml/sec to 1.8ml/sec), and from said point of time a constant of the injection rate (1.8ml/sec to 1.8 ml/sec). Fig.1C shows the other variable pattern C comprised of a linear decrease and a linear increase (2.0 ml/sec to 1.0 ml/sec, 1.0 ml/sec to 2.0 ml/sec).

RESULT

1. As shown in Fig.2A, the time density curve of pattern A had single peak at about 30 sec. In contrast, as shown in Fig.2B, the time density curve of pattern B had one peak at about 25 sec and substantially flat part followed the peak. This flat part extended between about 27or 28 sec and about 45 sec. As shown in Fig.2B, the time density curve of pattern C had a substantially flat part extending between about 27 or 28 sec and about 55 sec, and one peak followed the flat part at about 60 sec.

2. According to pattern B of the present invention, a state in which the CT value approximates the optimum level (for example 150 HU) can be maintained for long time compared with pattern A (see Fig.2A). Similarly, according to the pattern C of the present invention, a state in which the CT value approximates the optimum level can be maintained for long time compared with pattern A.

I declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true; and further that these statement were made with the knowledge that wilful, false statements and the like so made are punishable by fine of imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statement may jeopardize the validity of the application or patent issuing therefrom.
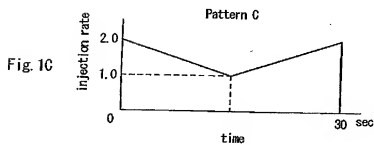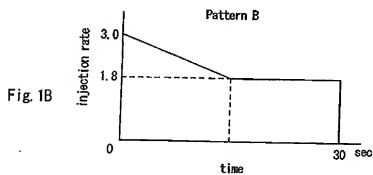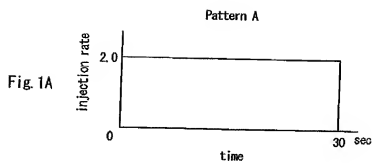
July 2, 2008

(Date)

Kazumasa MASUDA

Fig. 1A

Pattern A
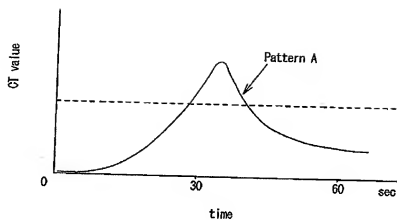
Fig. 1B

Pattern B

Fig. 1C

Pattern C

Fig. 2A

Fig. 2B